

nothing of the professed) naturalist to identify such specimens as might come under observation. All such difficulties vanish with Mr. Millais's life-sized coloured figures as a standard for comparison, the distinctive features of each species being brought clearly before the reader both in the text and in the plates. Much important work has also been done with regard to the local distribution of several of the species, notably as to the occurrence of the lesser horseshoe bat and the noctule in Wales. Whether Mr. Millais has been well advised, at all events in a work of this nature, in generically separating the noctule and Leisler's bat from the pipistrelle may, however, be open to question. Moreover, seeing that the author refuses to admit "*Myotis myotis*" into the British list, the propriety of assigning a separate heading to this species may perhaps likewise be doubtful.

Among the Carnivora, the account of the wild cat is of special interest, largely owing to the fact that the author does not endorse the views of the late Dr. Hamilton as to the practical extermination of this species in the British Islands. Not that it is anywhere common, even in the wilder parts of Scotland, where in many districts it has long since been killed off. At the present day, owing to a special cause, west Ross-shire appears to be its main stronghold. As to the extermination of the wolf and the bear from our islands, the author has much to say—and all that he says is worth reading. Very interesting, too, is his account of two distinct types of the fox in Scotland, namely, a dark and grey form in the mountains, and a smaller red or pale form in the lowlands. Apparently, however, he does not allude to the "greyhound fox" of the Lake District, which Cumberland sportsmen insist is entitled to be regarded as a distinct local race.

The most original and therefore the most valuable part of the section on the Carnivora is that relating to the British seals, of the characteristics and habits of which Mr. Millais has made himself thoroughly master as the result of personal observation in their native haunts; and no longer will naturalists find any difficulty in distinguishing between the common and the grey seal at all ages. Special interest attaches to the recognition of four distinct colour-phases in the adult male of the grey seal, although, since every intermediate stage between these may occur, and they are found together, they cannot be regarded as local races. Even more interesting is the statement that the young hooded seal is not, as commonly reported, white, but of the same mottled colour as the adult. It is, however, to be wished that the author had given the full reasons for this assertion.

The author has expressed the hope that his work may be found a fitting companion, as regards illustration, to Lord Lilford's volumes on British birds. So far as he has gone at present, he may be congratulated on having attained his ambition, and there is every reason to expect that the second and third volumes will be fully equal in this respect to the one before us. For many years this splendid work will probably remain one of the standard authorities on British mammals, and in the matter of illustration it will most likely be always without a rival.

R. L.

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FIRE RISKS.

Fire and Explosion Risks. By Dr. von Schwartz. Translated by C. T. C. Salter. Pp. xxi + 357. (London: Charles Griffin and Co., Ltd., 1904.) Price 16s. net.

In estimating the risks of fire due to the storage of goods of varying descriptions, the insurance companies are met by the difficulty that the knowledge necessary to gauge the comparative safety or otherwise of the materials present is of so technical a nature that but few possess it, and in many cases substances of apparently the most innocuous character become active sources of danger under conditions likely to escape the notice of any but those who have made a special study of the subject. As a result risks are often taken at far too low a premium, whilst the distrust born of the loss incurred afterwards leads to excessive charges in utterly wrong directions, very few insurance offices being fortunate enough to possess inspectors or assessors with the necessary knowledge to safely guide them in the adjustment of their scale of fees.

In Germany several works by such authorities as Dr. Richter, Prof. Hapke, and Dr. von Schwartz lend valuable aid to the scientific side of the question, but in England, with the exception of some valuable little works compiled by Mr. W. A. Harris, the able secretary to the Phoenix Fire Office in Liverpool, the literature of the subject has been entirely neglected, although the fact that on an average 10,000,000l. is annually paid by British fire insurance companies on fire claims alone, whilst the loss probably is nearly double this amount, suggests that the subject is well worth the deepest consideration.

Under these conditions it is a matter for congratulation that Mr. C. T. C. Salter has now given us an excellent translation of Dr. von Schwartz's valuable book on "Fire and Explosion Risks," a handbook which deals in a thoroughly practical way with the investigation, detection, and prevention of dangers arising in the manufacture and storage of the most widely used chemico-technical substances.

The author has had a very wide experience as a consulting chemist and factory inspector, and has brought his almost unique experience in manufacturing methods to bear upon the various risks which they entail, with the result that he has produced a work in which practice is so blended with theory as to make the book of the utmost value, not only to chemists, but also to those who, without much chemical knowledge, yet wish to master the mysteries of a very intricate branch of technical application.

In dealing with the various substances the raw material is fully described in each case, its origin, physical character, and behaviour under all conditions is freely discussed, whilst cautions and suggestions for the safe manipulation and storage of each are clearly stated.

The arrangement by sections of those bodies likely to react on each other is particularly useful, and the works chemist and insurance surveyor can find the information he seeks in relation to the particular class of goods with the minimum of trouble.

Taking the book as a whole, the reader's interest is fully sustained, and although one finds instances of duplication of cautions, this is evidently the result of the sectional arrangement and so unavoidable.

In so excellent a work detailed criticism is a somewhat thankless task, but it might be suggested that in discussing the risks attendant on the use of petroleum lamps, some notice might be taken of the views of Sir James Dewar, Dr. Boerton Redwood, and the late Sir Frederick Abel, as to increase of the flash point not being so complete a solution of the trouble as the author leads one to believe.

It might be well to note in a future edition that barium peroxide, which on p. 117 is said to become dangerous at 800° C., may also give rise to fire at atmospheric temperatures when exposed to friction with organic matter.

On p. 187 it is stated that one pound of calcium carbide furnishes 4 to 4½ cubic feet of acetylene, which is perfectly true of the inferior carbide made on the Continent, but with material of the quality until recently made at Foyers the yield rarely fell below 5 cubic feet per pound.

Occasionally one finds slight discrepancies in the statement of temperatures in different parts of the book, the temperature at which lead fuses being given at p. 291 as 325° C., whilst in the appendix, p. 343, it is stated to be 334° C. Such details as these, however, detract but little from the value of a book which is an important and most valuable addition to the technical literature of the day.

THE DETERMINATION OF MINERALS.

Mineral Tables—for the Identification of Minerals by their Physical Properties. By Arthur S. Eakle, Ph.D. Pp. 73. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1904.) Price 5s. 6d. net.

STUDENTS of mineralogy, miners, prospectors, and others interested in the determination of minerals by methods which do not involve the use of elaborate apparatus, will find this little book a useful addition to the literature of the subject.

The tables, though forming a volume of only 73 pages, include nearly 250 minerals, comprising all the commonly occurring ores, veinstones, and rock-formers, as well as a few species of more restricted occurrence. They are designed for the identification of unknown minerals by the examination of their physical properties alone; blowpipe reactions are not employed at all in the scheme. It is claimed by the author that the determination of minerals by blowpipe analysis is less apt to become merely mechanical if it has been preceded by practice in identification by physical properties. This is no doubt true; and if, as is often the case, the beginner is tempted to rely upon blowpipe analysis alone, that intimate acquaintance with minerals which is only gained as the result of the systematic observation of their physical properties, and which is so valuable for their ready recognition in the field, is either missed entirely or is only very imperfectly acquired. Indeed, in most cases blowpipe

reactions are best employed by the determinative mineralogist in confirming conclusions already arrived at from the evidence of physical properties. They are, however, so invaluable for this purpose, and afford such an indispensable aid to identification by physical properties, that any determinative scheme from which they are entirely excluded must be in a sense deficient. The author would have greatly added to the value of the tables by including for each species a brief statement of its distinctive blowpipe reactions, and we venture to suggest this extension of the scope of the work to him for future editions.

As in all tables of this kind, the identification of an unknown mineral is effected by a process of elimination. The minerals dealt with in the book are first divided into categories according to their colour in the powdered condition; these groups are then subdivided into minor groups according to the colour of the mineral in mass; and finally, the species in each of these divisions are arranged in order of hardness.

In general plan the tables are similar to those of Weisbach; but they differ from them in certain respects, notably in their greater simplicity, and in the abandonment of that indefinite and unsatisfactory property lustre, as an important means of discrimination. The tables are preceded by an "analytical key," by reference to which it is possible, after preliminary observations of streak and colour, to see at a glance in which table the mineral under examination will be found; it is then only necessary to determine the hardness and one or two other characters, such as crystalline form, structure, cleavage, specific gravity, and so forth—all of which are described in columnar form in the tables—to complete the identification.

The omission of the great majority of those rare minerals which the ordinary student or prospector is scarcely likely to meet with, and which by their insertion render so many books of this kind dear and unnecessarily complicated, is to be commended. The tables are certainly to be regarded as among the most satisfactory that have yet appeared.

OUR BOOK SHELF.

Die Sinnesorgane der Pflanzen. By G. Haberlandt. Pp. 46. (Leipzig: Barth, 1904.) Price 1 mark. THIS little book, which is appropriately dedicated to the memory of Darwin, was given as a lecture before the recent Versammlung deutscher Naturforscher und Ärzte at Breslau. The author devotes the chief part of his space to a semi-popular account of the various types of structures, such as bristles, hairs, papillæ, which serve for the perception of mechanical stimulus. This is necessarily, to a large extent, a recapitulation of his own interesting work on the subject, and is followed by an account of the *statolith* theory—the hypothesis independently put forward by himself and Némec as explaining the sensitiveness of plants to the force of gravity. The most interesting part of the lecture is, however, Haberlandt's concise discussion of his recent theory of the mechanism by which the direction of incident light is perceived by plants. He believes that the epidermic cells are, so to speak, the eyes of the plant. Thus, according to his view, when light strikes a leaf at right angles to the surface it results, from the plano-convex form of the epidermic cells, that the inner wall of each cell is illuminated